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Chapter 11: Trig Graphs Topic 6: Graphing Inverse Trig Functions

 $y = \arcsin x = \sin^{-1}x$

 $y = \arccos x = \cos^{-1}x$

 $y = \arctan x = \tan^{-1}x$

You cannot enter these functions into y = on your calculator to get a table.

In order to graph Inverse functions by using a table:

- 1. Create a table for the original function
 - (i.e. if you want to graph $y = \arcsin x$, then create a table for $y = \sin x$)
- 2. Create a new table for y = arcsinx by switching the values of x and y from the other table.
- 3. Plot all points from table, remember 90° is now on the y-axis and 1 is on the x-axis, so we must turn our graph paper the other way.

1. Graph the function $y = \arcsin x \le 360$

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<i>x_{radians}</i>	
<i>x_{degrees}</i>	
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2. Graph the function $y = \operatorname{Arccosx} \operatorname{from} 0 \le x \le 360$

<i>x_{radians}</i>	
$x_{degrees}$	
y	

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Domain and Range of Inverse Graphs

Inverse Notation:

 $\arcsin(x) = \sin^{-1}(x)$ $\arccos(x) = \cos^{-1}(x)$ $\arctan(x) = \tan^{-1}(x)$

 $y = \arcsin(x) = \sin^{-1}(x)$ solves the equation $x = \sin(y)$.

Look at the sine function on right. If we reflect this function over the identity line, y = xwe will create the inverse graph. Unfortunately, this newly formed inverse graph is not a function.

> Notice how the vertical line intersects the new inverse graph in more than one location, telling us it is not a function. (Vertical Line Test).

So how do we make it a function???

Limit the range!

By limiting the range to see all of the *y*-values without repetition, we can define inverse functions of the trigonometric functions. It is possible to form inverse functions at many different locations along the graph. The functions shown here are what are referred to as the "principal" functions.





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